

CLAIMS

1. An electric power supply system comprising:
 - a gas engine;
 - a gas turbine;
 - a gas collecting device configured to collect a gas being generated;
 - a gas separating device configured to classify the gas collected by the gas collecting device according to a content of combustible component contained in the gas;
 - a calorie adjusting device configured to mix gases having different contents of the combustible component which are supplied from the gas separating device to adjust the content of the combustible component of the gas to be supplied to the gas engine and the gas turbine; and
 - a system control device configured to control an operation of the gas engine, an operation of the gas turbine, and an operation of the calorie adjusting device.
2. The electric power supply system according to Claim 1, further comprising:
 - a gas amount balance monitor device configured to monitor balance of supply and demand between an amount of the gas consumed by the gas engine and the gas turbine under operating condition and an amount of the gas supplied from the calorie adjusting device to the gas turbine and the gas engine,
 - wherein the system control device is configured to control the operation of at least one of the gas engine, the gas turbine, and the calorie adjusting device, based on a signal from the gas amount balance monitor device.

3. The electric power supply system according to Claim 2, further comprising:
an exhausting device provided on a gas supply passage through which the gas is supplied to the gas turbine and the gas engine, to release the gas within the gas supply passage to outside, wherein

the system control device is configured to control an operation of the exhausting device based on the signal from the gas amount balance monitor device.

4. The electric power supply system according to Claim 1, further comprising a heat recovery boiler connected to the gas turbine.

5. The electric power supply system according to Claim 4, further comprising a steam turbine connected to the heat recovery boiler.

6. The electric power supply system according to Claim 1, wherein the gas separating device includes a combustible component meter configured to continuously measure the content of the combustible component of the gas collected by the gas collecting device, a plurality of gas supply passages through which the gases according to predetermined ranges of the content of the combustible component are supplied, and a passage-switching means configured to select one of the plurality of gas supply passages based on measurement results from the combustible component meter and to perform switching to the selected gas supply passage.

7. The electric power supply system according to Claim 1, the calorie adjusting device includes a plurality of gas supply passages to which gases separated according to the content of the combustible component by the gas separating device are supplied, a mixed gas supply passage to which the plurality of gas supply passages are connected, the mixed gas supply passage extending to the gas engine and the gas turbine, and opening and closing means configured to adjust open positions of the plurality of gas supply passages.

8. The electric power supply system according to Claim 7, wherein the calorie adjusting device further includes an air supply passage connected with the mixed gas supply passage, and the opening and closing means is configured to adjust open positions of the air supply passage and the plurality of gas supply passages.

9. The electric power supply system according to Claim 7 or 8, wherein the calorie adjusting device includes a feedback combustible component meter provided on the mixed gas supply passage, and a calorie adjustment control device configured to control the opening and closing means to allow the content of the combustible component to be set in a predetermined range, based on measurement results of the feedback combustible component meter.

10. The electric power supply system according to Claim 2 or 3, wherein the gas amount balance monitor device is provided on the mixed gas supply passage extending from the calorie adjusting device to the gas engine and the gas turbine,

the gas amount balance monitor device includes a closed container connected with the mixed gas supply passage, a pressure detector configured to detect an internal pressure of the closed container, and a first balance detector configured to detect a degree of balance supply and demand through comparison between detection results of the pressure detector and a preset reference pressure.

11. The electric power supply system according to Claim 2 or 3, wherein the gas amount balance monitor device is provided on the mixed gas supply passage extending from the calorie adjusting device to the gas engine and the gas turbine, and

the gas amount balance monitor device includes a container having an upper end opening and configured to connect with the mixed gas supply passage, a top lid configured to be vertically movable along inside of the container and to air-tightly close the upper end opening of the container, a position detector configured to detect a position of the top lid moving vertically according to variation in an internal pressure of the container, and a second balance detector configured to detect a degree of balance of supply and demand based on a detection signal from the position detector.

12. The electric power supply system according to Claim 1, wherein the system control device is configured to perform control to cause at least one gas turbine in operating condition to adjust its load according to variation in an amount of gas supply during the operation of both the gas engine and the gas turbine.

13. The electric power supply system according to Claim 12, wherein the system control device is configured to perform control to cause the gas turbine to vary the load according to a signal indicative of variation in the amount of gas supply from the gas amount balance monitor device.